Dual angiogenic and immunomodulating nanotechnology for subcutaneous stem cell derived islet transplantation for the treatment of diabetes

Grant Award Details

Dual angiogenic and immunomodulating nanotechnology for subcutaneous stem cell derived islet transplantation for the treatment of diabetes

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-12124

Project Objective: To enable the development of a combination therapeutic candidate composed of an HA hydrogel loaded with heparin nanoparticles, VEGF clusters and hESC-derived human islet-like organoids (HILO) to treat Type I Diabetes.

Investigator:

Name:	Eiji Yoshihara
Institution:	Lundquist Institute for Biomedical Innovation at Harbor - UCLA Medical Center
Type:	PI

Disease Focus: Diabetes, Metabolic Disorders, Type 1 diabetes

Human Stem Cell Use: Embryonic Stem Cell

Award Value: $250,000

Status: Active

Grant Application Details

Application Title: Dual angiogenic and immunomodulating nanotechnology for subcutaneous stem cell derived islet transplantation for the treatment of diabetes

Public Abstract:

Research Objective

Functional human islet like organoids differentiated from human pluripotent stem cells.

Impact

Providing the immediate cell therapeutic candidate for clinical trial of diabetic patients.

Major Proposed Activities

- Fabrication and characterization of the injectable immunomodulating and pro-angiogenic material components: HA hydrogel, heparin nanoparticles and VEGF clusters.
- Generation of human islet like organoids from pluripotent stem cells for subcutaneous transplantation
- Subcutaneous HILOs transplantation in pre-vasculature site in NOD-SCID mice.
- Subcutaneous PD-L1 expressing HILOs transplantation in pre-vasculature site in Hu-PBMC-NSG mice

Statement of Benefit to California:

The cell and technology products proposed by this diabetes therapeutic study will significantly improve future diabetes treatments in the State of California, particularly benefiting vulnerable populations, such as Hispanics, African-Americans, men, older populations, homeless individuals, and those of lower socioeconomic status. Additionally, this proposed research may create greater research employment opportunities in the South Bay, a region within Los Angeles County.
